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=> s l1 and (waveguide or optic? or spr or plasmon)

L2 0 L1 AND (WAVEGUIDE OR OPTIC? OR SPR OR PLASMON)

=> dup rem l1

PROCESSING COMPLETED FOR L1

L3 15 DUP REM L1 (6 DUPLICATES REMOVED)

=> d l3 bib ab 1-15

L3 ANSWER 1 OF 15 CAPLUS COPYRIGHT 2000 ACS

AN 2000:400754 CAPLUS

TI Adhesion strength of **DLC** films on glass with mixing layer
prepared by IBAD

AU Funada, Y.; Awazu, K.; Yasui, H.; Sugita, T.

CS Kanazawa, Tomizu-machi, Ro-1, Industrial Research Institute of Ishikawa, ,
920-0233, Ishikawa, Japan

SO Surf. Coat. Technol. (2000), 128-129, 308-312

CODEN: SCTEEJ; ISSN: 0257-8972

PB Elsevier Science S.A.

DT Journal

LA English

AB The improvement of the adhesion of diamond-like carbon (**DLC**) films has been tried by ion beam assisted deposition (IBAD). The adhesion strength must be quant. evaluated and detd. in order to confirm the improving effect of the adhesion of **DLC** films by IBAD. In this study, **DLC** films were prepd. on a glass substrate with a mixing layer prepd. by IBAD. For the samples, the scratch tests were carried out using a scratch tester with a CCD camera and two AE **sensors**. The detachment process of the **DLC** film during a scratch test was obsd. and the detachment area was measured. On the other hand, AE signals were detected corresponding to the detachment of the **DLC** film, and the force causing the detachment was detd. by analyzing the signals. The adhesion strength of **DLC** films was calcd. from the detachment area and the force. From that result, the adhesion strength of **DLC** films without a mixing layer was 3.2 MPa. When the mixing layer was formed by IBAD with a condition of Ar-30 kV and 2.1 .mu.A/cm2, the adhesion strength increased to 10.7 MPa. Furthermore, that increased up to 44 MPa in the case of 21.0 .mu.A/cm2. Therefore, it was realized that IBAD improved the adhesion of **DLC** films and the effects were made clear quant.

L3 ANSWER 2 OF 15 CAPLUS COPYRIGHT 2000 ACS

AN 1999:659567 CAPLUS

DN 131:280795

TI **Sensor** devices and methods for using them

IN Vadgama, Pankaj Madganlal; Warriner, Keith Stewart Robert

PA The Victoria University of Manchester, UK

SO PCT Int. Appl., 26 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9951973	A1	19991014	WO 1999-GB985	19990330
	W:	AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX,			

NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT,
 UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
 RW: GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW, AT, BE, CH, CY, DE, DK,
 ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG,
 CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

GB 2335985 A1 19991006 GB 1998-7112 19980403
 AU 9931599 A1 19991025 AU 1999-31599 19990330
 PRAI GB 1998-7112 19980403
 WO 1999-GB985 19990330

AB Copper electrodes coated on their surface with diamond-like carbon (**DLC**), and their use in electrolytic devices and procedures. The diamond-like carbon coating, usually <5 .mu. thick, enables the benefits of copper electrodes to be obtained in media less alk. than the highly alk. ones usually required for bare copper electrodes. The copper may be solid or carried as a surface layer upon a carrier of any desired shape or degree of cond. or strength. The coated electrodes are esp. advantageous as working electrodes in **sensors** and methods for electrochem. anal. and particularly for detn. of analytes which undergo reaction, esp. oxidn., at copper electrodes. They have especial value for electro-anal. of hydroxylated compds., esp. those relatively resistant to electrolytic oxidn. (e.g. sugars and ethanol) and their operability at less alk. pH enables convenient and easy monitoring of fermn. processes.

RE.CNT 3

RE

- (1) Chen, Z; JOURNAL OF CHROMATOGRAPHY A 1997, V766 CAPLUS
- (2) Univ Manchester; WO 9324828 A 1993
- (3) Yamamoto, K; US 4797527 A 1989 CAPLUS

L3 ANSWER 3 OF 15 CAPLUS COPYRIGHT 2000 ACS

AN 1999:388357 CAPLUS

DN 131:27253

TI Electrochemical **sensor** devices and methods for using them

IN Vadgama, Pankaj Madganlal; Warriner, Keith Stewart Robert

PA The Victoria University of Manchester, UK

SO PCT Int. Appl., 26 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9930143	A1	19990617	WO 1998-GB3585	19981201
	W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
	GB 2332058	A1	19990609	GB 1997-25707	19971205
	AU 9913434	A1	19990628	AU 1999-13434	19981201
PRAI	GB 1997-25707		19971205		
	GB 1998-18509		19980826		
	WO 1998-GB3585		19981201		

AB **Sensor** devices for electrolytic anal. of liq. media, comprising a working electrode coated with an amino acid polymer (preferably poly-lysine on platinum), advantageously with a diffusion-lowering barrier layer of an applied or deposited thin porous or permeable layer of org. polymer or inorg. material superimposed upon it which allows analytes to pass through. The barrier coating stabilizes the poly-amino acid coating against dislodgement by acidic media and the poly-amino acid/covering barrier combination gives a **sensor** having enough stability to be heat-sterilized, good pH independence and selectivity with minimal interference by other components, and long user life. Preferred barrier materials are PVC, (which can be applied from soln., e.g. dip-coating) and diamond-like carbon (**DLC**), preferably 5.mu.m thick or less. The electro-anal. procedure preferred is pulsed amperometric detection (PAD). The **sensors** are esp. effective for ethanol detn., and applicable

to monitoring and measurement of fermn. media with reduced interference by
any sugars present.

RE.CNT 5

RE

- (1) Hiroko, K; US 5281319 A 1994
 - (2) Pickett, C; J CHEM SOC DALTON TRANS 1994, V14, P2181
 - (3) Toray Industries; EP 0266432 A 1988
 - (4) Vadgama, P; WO 9324828 A 1993
 - (5) Watkins, B; JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 1975, V97(12), P3549
- CAPLUS

L3 ANSWER 4 OF 15 CAPLUS COPYRIGHT 2000 ACS

AN 1999:127046 CAPLUS

DN 130:150618

TI Ion-sensitive **sensor** devices with diamond-like carbon coating
and analytical methods using them

IN Vadgama, Pankaj Madganlal; Warriner, Keith Stewart Robert

PA The Victoria University of Manchester, UK

SO PCT Int. Appl., 22 pp.

CODEN: PIXXD2

DT Patent

LA English

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9907878	A1	19990218	WO 1998-GB2301	19980731
	W:	AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
	RW:	GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
	GB 2328023	A1	19990210	GB 1997-16749	19970808
	AU 9886360	A1	19990301	AU 1998-86360	19980731
PRAI	GB 1997-16749		19970808		
	WO 1998-GB2301		19980731		

AB Disclosed are improved **sensor** devices responsive to ionic changes, and esp. pH changes, of media in contact with them, wherein the **sensor** element is coated with diamond-like carbon, and anal. methods for their use. The device is esp. applicable to systems in which the pH change measured is the result of enzyme action, particularly by formation of a basic product, for example using urease as the enzyme to form ammonia from urea. The preferred **sensor** element is a solid-state device, notably an enzyme field effect transistor in which the enzyme is bound on the surface of a semiconductor in conjunction with a conducting polymer, preferably polypyrrole. Detns. are usually made by measurement of the impedance of the **sensor** when in contact with a buffered soln. of the sample to be examd., and can be used for detg. urea levels in blood. A urea-sensitive urease/polypyrrole impedimetric **sensor** was prepd. having immobilized urease and an outer coating of diamond-like carbon (DLC). **Sensors** with the DLC coating had lower responses to urea than those not coated, but, more importantly, they were almost independent of soln. buffering capacity (content of buffer salts).

RE.CNT 4

RE

- (1) Higson, S; Analytica Chimica Acta 1993, V271(1), P125
- (2) Ici Plc; EP 0503943 A 1992
- (3) Thermo Fast U K Limited; WO 9810288 A 1998
- (4) Univ Manchester; WO 9324828 A 1993

L3 ANSWER 5 OF 15 CAPLUS COPYRIGHT 2000 ACS

AN 1999:363349 CAPLUS

DN 131:78853

TI Surface phenomena of the thin diamond-like carbon films

AU Polyakov, V. I.; Rukovichnikov, A. I.; Khomich, A. V.; Druz, B. L.; Kania, D.; Hayes, A.; Prelas, M. A.; Tompson, R. V.; Ghosh, T. K.; Loyalka, S. K.

CS Institute of Radio Eng. and Electronics, RAS, Moscow, 103907, Russia
SO Mater. Res. Soc. Symp. Proc. (1999), 555(Properties and Processing of Vapor-Deposited Coatings), 345-350
CODEN: MRSPDH; ISSN: 0272-9172
PB Materials Research Society
DT Journal
LA English
AB Diamond-like carbon films (DLC) 10-40 nm thick were deposited on quartz substrates on an interdigitated planar array of 20 .mu.m Ni electrodes already prepd. by lithog. techniques. The influence of the adsorbed mols. on the elec. properties of the thin DLC films was investigated. Current and capacitance-voltage characteristics were examd. Charge-based deep level transient spectroscopy (Q-DLTS) was used for study of adsorption and desorption processes. The strong sensitivity of Q-DLTS spectra to the presence of the vapor water and iso-Pr alc. was found. For example, the Q-DLTS signal for some deposited DLC film was changed more then in order in presence of the water vapor. Such strong surface phenomena of the thin DLC films may be exploited in novel gas **sensor** devices.

RE.CNT 9

RE

- (1) Arora, B; J Appl Phys 1993, V73, P1802 CAPLUS
- (2) Druz, B; Mater Res Soc Proc 1997, V446, P413 CAPLUS
- (3) Druz, B; Surface Coatings Technol 1996, V86-87, P708 CAPLUS
- (4) Lang, D; J Appl Phys 1974, V45, P3023 CAPLUS
- (5) Pimenov, S; Diamond and Related Materials 1997, V6, P1650 CAPLUS

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 6 OF 15 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 1
AN 1998:591952 CAPLUS
DN 129:305605
TI The mass recognizing property of DLC [diamond-like carbon] film for formic acid vapors
AU Yan, Yonghong; Zeng, Yun; Xiang, Jiannan; Yin, Xia; Jin, Jiucheng; Che, Zengzhang
CS Dep. Physics, Institute Chem., Hunan Univ., Changsha, 410082, Peop. Rep. China
SO Chin. Sci. Bull. (1998), 43(15), 1307-1311
CODEN: CSBUEF; ISSN: 1001-6538
PB Science in China Press
DT Journal
LA English
AB The carbon films are prepd. by r.f. plasma method with n-butylamine as carbon source. The anal. of Raman spectroscopy shows that this kind of carbon film has diamond-like structure, and IR spectroscopy measurement indicates that there are SP2 bonding, SP3 bonding and amino-group in the film. It is the existence of amino-group and hydrogen atom that cause the amorphous structure and the deformation of bonding to increase, thus leading the Raman spectrum to form a broad absorption band. The quartz crystal microbalance (QCM) deposited with this kind of carbon film as recognizing coating is very sensitive to formic acid vapors. This QCM **sensor** has good reproducibility, high stability, rapid response and long lifetime.

L3 ANSWER 7 OF 15 CAPLUS COPYRIGHT 2000 ACS
AN 1999:239359 CAPLUS
DN 130:331910
TI Electronic characterization of thin diamond like carbon films for pH-**sensor** applications
AU Schitthelm, Frank; Rover, Kai-Sven; Ferretti, Rudiger
CS Institut fur Halbleitertechnologie und Werkstoffe der Elektrotechnik, University of Hannover, Hannover, 30167, Germany
SO Proc. SPIE-Int. Soc. Opt. Eng. (1998), 3539(Chemical Microsensors and Applications), 139-146
CODEN: PSISDG; ISSN: 0277-786X
PB SPIE-The International Society for Optical Engineering
DT Journal
LA English
AB Amorphous Diamond like carbon (DLC) thin films were deposited on

to 4"-silicon wafers by an electron cyclotron resonance (ECR) microwave excited methane (CH₄) ethyne (C₂H₂) plasma at low pressure. Electronic characterization of **DLC** films were performed by I/V and C/V measurements using MIS-structures. Whereas the electrochem. pH-characteristics were measured using ion-sensitive field-effect transistors (ISFET). It is shown, that the type of carrier transport mechanism in **DLC** films depends on the process conditions and that the elec. cond. varies over a wide range. This can be adjusted mainly by the kinetic energy of the C_xH_x⁺ ions and the C to H ratio, which depends on the type of process gas. The dominant charge transport mechanism in **DLC** films based on a methane plasma is the Poole-Frenkel emission whereas the charge flow for ethyne based **DLC** films is space-charge limited. The electronic cond. of **DLC** films deposited with ethyne as process gas is typically about five orders of magnitude higher than methane based films. The electrochem. characterization shows a pH-sensitivity at 50-57 mV/pH and a long-term pH signal stability at 0.3-25 .mu.V/h. Based on the different pH-sensitivities it will be possible to produce a pH-sensor in differential mode using **DLC/DLC** or **DLC/Ta2O5** combinations for the sensitive layers.

RE.CNT 12

- RE
- (1) Barbottin, G; Instabilities in silicon devices 1986, V1 (ISBN 0 444 87944 7)
 - (3) Cho, N; J Mater Res 1990, V5(11), P2543 CAPLUS
 - (5) Dowling, D; Surf Coat Technol 1992, V53, P177 CAPLUS
 - (8) Ianno, N; Appl Phys Commun 1993, V12(1), P105 CAPLUS
 - (10) Raveh, A; Surf Coat Technol 1992, V53, P275 CAPLUS
- ALL CITATIONS AVAILABLE IN THE RE FORMAT

L3 ANSWER 8 OF 15 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 2
 AN 1998:86033 CAPLUS
 DN 128:162257
 TI Diamond-like carbon-gate pH-ISFET
 AU Voigt, H.; Schitthelm, F.; Lange, T.; Kullick, T.; Ferretti, R.
 CS Institut fur Halbleitertechnologie und Werkstoffe der Elektrotechnik,
 University of Hannover, Hannover, 30167, Germany
 SO Sens. Actuators, B (1997), B44(1-3), 441-445
 CODEN: SABCEB; ISSN: 0925-4005
 PB Elsevier Science S.A.
 DT Journal
 LA English
 AB A novel chem.-resistant ion-selective field-effect transistor (ISFET) array is introduced, using amorphous diamond-like C (**DLC**) films for passivation and as pH-sensitive layer. A **DLC** coating technol. is developed, useful for depositing and patterning final thin film on active and passive surfaces of ISFET devices. The **DLC** films are produced by a low-temp. dual radiofrequency methane-He gas mixt. plasma. **DLC** thin films show complete chem. inert behavior in aggressive aq. electrolytes. The high film hardness in addn. to the chem. inert behavior makes **DLC** films more suitable as passivation layers for **sensor** devices than other materials (i.e. Si₃N₄, SiO₂, etc.). It is shown from the results of electrochem. and electronic characterization of ISFET devices with **DLC** thin films that **DLC** is suitable for **sensor** applications. A comparative characterization of **DLC**-coated ISFET with a Ta₂O₅-coated ISFET on a single chip **sensor** is shown. The pH response of the **DLC** ISFET shows lower drift than that of the Ta₂O₅-coated ISFET. No redox cross-sensitivity was found or **DLC**-coated ISFET. The shift of the **sensor** response is only slightly dependent on temp.

L3 ANSWER 9 OF 15 CAPLUS COPYRIGHT 2000 ACS
 AN 1997:589266 CAPLUS
 DN 127:265003
 TI Development of plasma technology for high performance carbon materials from natural gas
 AU Yu, Zuo-Long; Zhou, Kun-Lin; Cao, Wei-Min; Zeng, Da-Quan; Chen, Mian-Zhong; Zhou, Gu-Min; Zhang, Xiang-Fu; Zhang, Yong
 CS Chengdu Institute of Organic Chemistry, The Chinese Academy of Sciences, Chengdu, 610041, Peop. Rep. China

SO J. Nat. Gas Chem. (1997), 6(3), 175-187
 CODEN: JGCHE8; ISSN: 1000-9953

PB Chengdu Institute of Organic Chemistry, Academia Sinica

DT Journal

LA English

AB Ultrafine carbon particle and diamond like carbon film, compounded carbon with Ti, Si, Sn, Ni, Pt etc., may have superb characteristics in hardness, lubrication, heat cond., photo-transmissivity, semicond. etc. The carbon materials were prepd. from natural gas by using plasma. The type of plasma, working atm. and conditions have been studied. The properties and applications of some typical ultrafine carbon particles and diamond like carbon films were also discussed.

L3 ANSWER 10 OF 15 CAPLUS COPYRIGHT 2000 ACS

AN 1997:229994 CAPLUS

TI Micromachining.

AU De Rooij, N. F.

CS Institute Microtechnology, University Neuchatel, Neuchatel, CH-2007, Switz.

SO Book of Abstracts, 213th ACS National Meeting, San Francisco, April 13-17 (1997), BTEC-008 Publisher: American Chemical Society, Washington, D. C. CODEN: 64AOAA

DT Conference; Meeting Abstract

LA English

AB Recent progress in micromachining of several materials will be reviewed, focusing on single crystal silicon, quartz and glass. In particular the importance of these materials for the construction of miniaturized chem. anal. systems will be outlined. Representative examples of chem. anal. systems using micromachining techniques will be presented including (1) ion-analyzers, (2) a bioreactor for space research, (3) nanotitrators. Also recent developments in amperometric chem. **sensors** using diamond like carbon (**DLC**) thin films will be discussed.

L3 ANSWER 11 OF 15 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 3

AN 1995:286284 CAPLUS

DN 122:75827

TI Diamond like carbon films for enzyme electrodes; characterization of novel overlying permselective barriers

AU Higson, Seamus P. J.; Vadgama, Pankaj M.

CS Department of Medicine (Section of Clinical Biochemistry), University of Manchester, Hope Hospital, Eccles Old Road, Salford, M6 8HD, UK

SO Anal. Chim. Acta (1995), 300(1-3), 85-90
 CODEN: ACACAM; ISSN: 0003-2670

DT Journal

LA English

AB Diamond like carbon (**DLC**) coated microporous polycarbonate membranes have been studied for use as novel composite permselective barriers membranes for a glucose enzyme electrode. Permeability coeffs., P, for key electrochem. active interferents across uncoated and **DLC** coated polycarbonate membranes has been compared. Interferent responses have then been assessed for **sensors** incorporating such membranes, and their relationship to differing **DLC** depositions assessed. Membranes with smaller pore sizes (0.03 and 0.01 μm) and extended **DLC** depositions (up to 7 min coating), while imparting some enhanced selectivity towards glucose, failed to show major discrimination for glucose over interferents as shown by P values: max. glucose-to-interferent P ratios being 1.36 and 1.25 for ascorbate and urate, resp. The implications of these findings are discussed.

L3 ANSWER 12 OF 15 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 4

AN 1995:286283 CAPLUS

DN 122:75826

TI Diamond-like carbon coated films for enzyme electrodes; characterization of biocompatibility and substrate diffusion limiting properties

AU Higson, Seamus P. J.; Vadgama, Pankaj M.

CS Department of Medicine (Section of Clinical Biochemistry), University of Manchester, Hope Hospital, Eccles Old Rd., Salford, M6 8HD, UK

SO Anal. Chim. Acta (1995), 300(1-3), 77-83
 CODEN: ACACAM; ISSN: 0003-2670

DT Journal
LA English
AB The biocompatibility and substrate diffusion limiting properties for a range of diamond like carbon (**DLC**) coated microporous polycarbonate and **DLC**-coated dialysis (hemodialysis) membranes were studied. This characterization builds upon previous findings where **DLC** coated membranes imparted enhanced enzyme electrode performance. In this study, electrode linear ranges were extended from 10 mM glucose for a 0.01 μm pore size membrane to 160 mM. These findings correlated with the duration of **DLC** deposition and assocd. redns. in permeability for glucose. Permeability coeff. ratios for both microporous and dialysis membranes were also found to be important with low glucose/O₂ permeability ratios imparting extensions in glucose linear response range. **DLC**-coated membranes employed within enzyme electrodes have also been shown to exhibit enhanced hemocompatibility as detd. by both sensitivity change and surface deposition of blood components examd. by SEM. Correlations are made between the reduced losses in **sensor** response to biofouling/working electrode passivation processes, and extended linear ranges that **DLC** coated membranes may impart to enzyme electrode performance. Particular ref. is made to the detn. of glucose levels within whole blood.

L3 ANSWER 13 OF 15 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 5

AN 1994:522446 CAPLUS

DN 121:122446

TI The properties of diamond-like carbon layers deposited onto SiO₂ aerogel
AU Mitura, E.; Wawrzyniak, P.; Rogacki, G.; Szmidt, J.; Jakubowski, A.
CS Faculty of Process and Environmental Engineering, Technical University of Lodz, Wolczanska 175, Lodz, 90-924, Pol.

SO Diamond Relat. Mater. (1994), 3(4-6), 868-70

CODEN: DRMTE3

DT Journal

LA English

AB Possible prodn. of an SiO₂ aerogel coated with diamond-like carbon (**DLC**) by the r.f. decompn. of methane is presented. The silica gel was obtained by hydrolysis and condensation of tetraethoxysilane. A two-step method was used. One set of gel samples was heated in the autoclave filled with alc. and decompressed isothermally after reaching the crit. point of the solvent. Another set was subjected to supercrit. extn. of alc. by carbon dioxide followed by isothermal decompression at a temp. higher than the crit. temp. of CO₂ (304.2 K). In the processes described transparent aerogels of d. 104-115 kg m⁻³ were obtained. The influence of **DLC** coating on the mech. strength of the **DLC**-SiO₂ aerogel system is presented. The **DLC** layer was deposited onto two surfaces of an aerogel plate by r.f. plasma chem. vapor deposition. The **DLC** films are very hard and resistant to acids and bases. **DLC**, which is semitransparent for mass transfer, is a good material for **sensors**. Together with the aerogel substrate the **DLC** film creates a structure which is very promising for electronics.

L3 ANSWER 14 OF 15 CAPLUS COPYRIGHT 2000 ACS

AN 1995:876884 CAPLUS

DN 123:320511

TI Automotive applications of diamond and diamondlike materials

AU Tamor, Michael A.

CS Research Laboratory, Ford Motor Company, Dearborn, MI, 48121-2053, USA

SO Int. Conf. Appl. Diamond Films Relat. Mater., 2nd (1993), 229-36.

Editor(s): Yoshikawa, Masanori. Publisher: Scientific Publishing Division of MYU, Tokyo, Japan.

CODEN: 61WDAW

DT Conference

LA English

AB Three thrust areas for automotive application of diamond and diamondlike coatings have been identified and are under active development at Ford. These are: (1) low cost CVD diamond-coated cemented-carbide tools for machining of hypereutectic Al:Si alloys, metal-matrix composites, and reinforced polymer composites, (2) semiconducting diamond **sensors** for hot or corrosive environments, and (3) diamondlike carbon coatings for

reduced friction and wear of rolling and sliding components. Recent results, prospects and limitations for diamond and DLC each of these areas will be discussed.

L3 ANSWER 15 OF 15 BIOSIS COPYRIGHT 2000 BIOSIS DUPLICATE 6
AN 1993:160617 BIOSIS
DN PREV199395081667
TI Diamond-like carbon coated microporous polycarbonate as a composite barrier for a glucose enzyme electrode.
AU Higson, Seamus P. J. (1); Vadgama, Pankaj M.
CS (1) Dep. Med., Univ. Manchester, Hope Hosp., Eccles Old Rd., Salford M6 8HD UK
SO Analytica Chimica Acta, (1993) Vol. 271, No. 1, pp. 125-133. ISSN: 0003-2670.
DT Article
LA English
AB Diamond-like carbon (DLC) coated microporous polycarbonate membranes were used as outer covering membranes in glucose enzyme electrodes. With optimised DLC deposition and the use of 0.01 μm microporous polycarbonate, biocompatibility has been seen to improve with only a loss of 6% response after 30 min exposure to whole blood, and a correlation to within 1 mM concentration with a standard laboratory method. In addition, control of the coating process allowed substrate diffusion-limiting properties to the bulk enzyme to be finely tuned permitting extensions in linearity ranges from 5 to gt 80 mM glucose. Furthermore the higher biocompatibility coupled with the degree of permselectively exhibited by DLC has enabled operation within whole blood without a second hydrogen peroxide selective barrier membrane. Permeability coefficients of glucose and O-2 determined for corresponding membranes by a classical diffusion chamber technique suggest that both the glucose/O-2 permeability coefficient ratios and the absolute glucose permeability influenced the linearity range.

=> s dlc and (plasmon)

L4 17 DLC AND (PLASMON)

=> dup rem 14

PROCESSING COMPLETED FOR L4

L5 12 DUP REM L4 (5 DUPLICATES REMOVED)

=> d 15 bib ab 1-12

L5 ANSWER 1 OF 12 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 1
AN 2000:347241 CAPLUS
TI Density, sp3 content and internal layering of DLC films by X-ray reflectivity and electron energy loss spectroscopy
AU LiBassi, A.; Ferrari, A. C.; Stolojan, V.; Tanner, B. K.; Robertson, J.; Brown, L. M.
CS Department of Physics, University of Durham, Durham, DH1 3LE, UK
SO Diamond Relat. Mater. (2000), 9(3-6), 771-776
CODEN: DRMTE3; ISSN: 0925-9635
PB Elsevier Science S.A.
DT Journal
LA English
AB A variety of hydrogenated and non-hydrogenated amorphous carbon thin films have been characterised by means of grazing-incidence X-ray reflectivity (XRR) to give information about their d., thickness, surface roughness and layering. We used XRR to validate the d. of ta-C, ta-C:H and a-C:H films derived from the valence plasmon in electron energy loss spectroscopy measurements, up to 3.26 and 2.39 g/cm³ for ta-C and ta-C:H, resp. By comparing XRR and electron energy loss spectroscopy (EELS) data, we have been able for the first time to fit a common electron effective mass of $m^*/m_e=0.87$ for all amorphous carbons and diamond, validating the 'quasi-free' electron approach to d. from valence plasmon energy. While hydrogenated films are found to be substantially uniform in

d. across the film, ta-C films grown by the filtered cathodic vacuum arc (FCVA) show a multilayer structure. However, ta-C film grown with an S-bend filter show a high uniformity and only a slight dependence on the substrate bias of both sp³ and layering.

RE.CNT 23

RE

- (1) Berger, S; Phil Mag Lett 1988, V57, P285 CAPLUS
- (2) Conway, N; Appl Phys Lett 1998, V73, P2456 CAPLUS
- (3) Davis, C; Phys Rev Lett 1998, V80, P3280 CAPLUS
- (5) Fallon, P; Phys Rev B 1993, V48, P4777 CAPLUS
- (7) Logothetidis, S; Appl Phys Lett 1997, V71, P2463 CAPLUS

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 2 OF 12 CAPLUS COPYRIGHT 2000 ACS

AN 2000:187061 CAPLUS

DN 132:227718

TI Comparative study of properties of DLC films by electron energy loss spectroscopy and X-ray reflectivity

AU Stolojan, V.; Brown, L. M.; Ferrari, A. C.; Robertson, J.; Bassi, A. Li; Tanner, B. K.

CS Cavendish Laboratory, University of Cambridge, Cambridge, CB3 0HE, UK

SO Inst. Phys. Conf. Ser. (1999), 161(Electron Microscopy and Analysis 1999), 361-364

CODEN: IPCSEP; ISSN: 0951-3248

PB Institute of Physics Publishing

DT Journal

LA English

AB Electron Energy Loss Spectroscopy (EELS) and Grazing Incidence X-Ray Reflectivity (GIXRR) are techniques employed in the study of the technol. important carbon thin films. In EELS, from the plasmon energy we can obtain the mass d. per contributing valence electron, and the sp² content is obtained from the normalized intensity of the .pi.* peak in the carbon K-edge. From GIXRR, we can calc. the mass d. per electron and we can obtain information about thickness, roughness and internal layering. The transition from 1s-2p in the sp²-hybridized carbon takes place in a uniaxially anisotropic at. field. This leads the normalized intensity of the .pi.* peak in EELS to be dependent on the convergence conditions and on the orientation of the anisotropy axis relative to the direction of the beam. Our calcns. show this to affect sp² measurements in amorphous carbon films as well as in graphite, and we find the specific choice of convergence conditions for which this effect is cancelled. By comparing the d. per contributing electron measured from EELS with the d. measured from GIXRR, we can fit an effective mass for the valence electron for all amorphous carbons, which is very nearly that of diamond and we use it to plot a general relationship between sp³ and mass d. for a wide range of hydrogenated and non-hydrogenated carbon films.

RE.CNT 11

RE

- (2) Fallon, P; Diamond Relat Mater 1993, V2, P1004 CAPLUS
- (5) Menon, N; Ultramicroscopy 1998, V74, P83 CAPLUS
- (6) Milani, P; J Appl Phys 1997, V82, P5793 CAPLUS
- (7) Morrison, N; Thin Solid Films 1999, V337, P71 CAPLUS
- (11) Wormington, M; Phil Mag Lett 1996, V74, P211 CAPLUS

ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 3 OF 12 CAPLUS COPYRIGHT 2000 ACS

AN 1999:795260 CAPLUS

DN 132:169909

TI The structural and electron field emission characteristics of pulsed laser deposited diamond-like carbon films with thermal treatment

AU Jung, H.-S.; Park, H.-H.; Pang, S. S.; Lee, S. Y.

CS Seodaemoon-ku, Shinchon-dong, 134, Department of Ceramic Engineering, Yonsei University, Seoul, S. Korea

SO Thin Solid Films (1999), 355-356, 151-156

CODEN: THSFAP; ISSN: 0040-6090

PB Elsevier Science S.A.

DT Journal

LA English

AB Diamond-like carbon (DLC) films have been deposited on Si(100)

by pulsed laser deposition (PLD) using 355 nm (Nd:YAG) laser. To investigate the factor that dominates the electron field emission behavior of **DLC** film, structural and elec. properties have been studied as a function of anneal temp. Degradn. of **DLC** film properties began to be obsd. above 400.degree.C but, in case of **plasmon** energy loss and emission behavior, there were variations of properties at 300.degree.C. From these results, we are convinced that anneal treatment modifies sp³/sp² bonding ratio in surface as well as bulk of film but the anneal effect is more intensified on the surface than the bulk of **DLC** film. It is also obsd. that the electron field emission property is affected by the modification of sp³/sp² bonding ratio in the film surface.

RE.CNT 13

RE

- (2) Chuang, F; Appl Phys Lett 1997, V70, P2111 CAPLUS
 - (3) Cuomo, J; J Appl Phys 1991, V70, P1706 CAPLUS
 - (4) Geis, M; Electron Device Lett 1991, V12, P456 CAPLUS
 - (5) Hauser, J; J Non-Cryst Solids 1977, V23, P21 CAPLUS
 - (6) Karpman, J; Diam Rel Mater 1994, V4, P10 CAPLUS
- ALL CITATIONS AVAILABLE IN THE RE FORMAT

L5 ANSWER 4 OF 12 SCISEARCH COPYRIGHT 2000 ISI (R)

AN 2000:33759 SCISEARCH

GA The Genuine Article (R) Number: 269WP

TI The structural and electron field emission characteristics of pulsed laser deposited diamond-like carbon films with thermal treatment

AU Jung H S; Park H H (Reprint); Pang S S; Lee S Y

CS YONSEI UNIV, DEPT CERAM ENGN, SEODAEMOON KU, 134 SHINCHON DONG, SEOUL 120749, SOUTH KOREA (Reprint); YONSEI UNIV, DEPT CERAM ENGN, SEODAEMOON KU, SEOUL 120749, SOUTH KOREA; YONSEI UNIV, DEPT ELECT ENGN, SEODAEMOON KU, SEOUL 120749, SOUTH KOREA

CYA SOUTH KOREA

SO THIN SOLID FILMS, (NOV 1999) Vol. 356, pp. 151-156.

Publisher: ELSEVIER SCIENCE SA, PO BOX 564, 1001 LAUSANNE, SWITZERLAND.
ISSN: 0040-6090.

DT Article; Journal

FS PHYS; ENGI

LA English

REC Reference Count: 12

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB Diamond-like carbon (**DLC**) films have been deposited on Si(100) by pulsed laser deposition (PLD) using 355 nm (Nd:YAG) laser. In order to investigate the factor that dominates the electron field emission behavior of **DLC** film, structural and electrical properties have been studied as a function of anneal temperature. Degradation of **DLC** film properties began to be observed above 400 degrees C but, in case of **plasmon** energy loss and emission behavior, there were variations of properties at 300 degrees C. From these results, we are convinced that anneal treatment modifies sp⁽³⁾/sp⁽²⁾ bonding ratio in surface as well as bulk of film but the anneal effect is more intensified on the surface than the bulk of **DLC** film. It is also observed that the electron field emission property is affected by the modification of sp⁽³⁾/sp⁽²⁾ bonding ratio in the film surface. (C) 1999 Elsevier Science S.A. All rights reserved.

L5 ANSWER 5 OF 12 CAPLUS COPYRIGHT 2000 ACS

DUPLICATE 2

AN 1998:10389 CAPLUS

DN 128:142697

TI Carbon transport in Si(001) and nucleation of diamond-like carbon layers during mass selected carbon ion beam deposition

AU Christiansen, S.; Albrecht, M.; Strunk, H. P.; Ronning, C.; Hofsass, H.; Recknagel, E.

CS Lehrstuhl fur Mikrocharakterisierung, Institut fur Werkstoffwissenschaften, Universitat Erlangen-Nurnberg, Erlangen, 91058, Germany

SO Diamond Relat. Mater. (1998), 7(1), 15-22

CODEN: DRMT3; ISSN: 0925-9635

PB Elsevier Science S.A.

DT Journal

LA English
AB We investigate the transport of carbon into the Si(001) substrate during the initial stages of the deposition of amorphous hydrogen-free diamond-like carbon (DLC) films. We employ mass selected ion beams of 50, 100, 500 and 1000 eV $12C^+$ ions. The microstructures of the produced DLC films, of the substrate and of the interface are characterized by transmission electron microscopy. Electron diffraction exhibits all the DLC films to be amorphous. Parallel electron energy loss spectroscopy shows plasmon peaks at around 30 eV for all room temp. deposited DLC films, which indicates sp^3 -coordination of C atoms in the amorphous network. Thus amorphous diamond has formed. The Si substrates are affected by the DLC deposition as dependent on the deposition energy. (i) at all energies these are highly strained; after 100 eV deposition they are highly dislocated, (ii) the substrate contains a high amt. of carbon, according to secondary ion mass spectroscopy up to 1 at.%, and (iii) the carbon content is found far beyond a depth of a few nm that is expected for thermal diffusion and for the ion implantation range. We discuss the nucleation and growth of the DLC layer as a function of the deposition energy and find corroboration of the subplantation model. The unusually deep-reaching carbon in the substrate is discussed in view of mass transport mechanisms that are enhanced by Si point defects created in excessively high densities due to carbon ion impact.

L5 ANSWER 6 OF 12 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 3
AN 1997:601923 CAPLUS
DN 127:324038
TI Fine structures of valence-band, x-ray-excited Auger electron, and plasmon energy loss spectra of diamondlike carbon films obtained using x-ray photoelectron spectroscopy
AU Seo, S.-C.; Ingram, D. C.
CS Condensed Matter and Surface Sciences Program, Department of Physics and Astronomy, Ohio University, Athens, OH, 45701-2979, USA
SO J. Vac. Sci. Technol., A (1997), 15(5), 2579-2584
CODEN: JVTAD6; ISSN: 0734-2101
PB American Institute of Physics
DT Journal
LA English
AB The electronic structures of diamond and graphite using XPS are compared to that of diamond-like carbon (DLC) films that were deposited using unbalanced magnetron sputtering. High resolu. spectra were obtained for the XPS valence-band, x-ray-excited Auger electron (XAES), and photoelectron energy loss. The electronic structures of DLC films are discussed as a function of argon gas pressure and the results are in good agreement with the optical band gap measurement. The XAES spectra from diamond, DLC, and graphite samples show noticeable differences. The XAES $N(E)$ spectra from DLC films contain four carbon KLL transition peaks. The features of the XAES spectra of DLC films are similar to diamond and do not show a graphite-like shoulder. The DLC films deposited at low argon gas pressure show evidence of diamond-like fine structure in the valence-band and photoelectron energy loss spectra, and have wider optical band gaps.

L5 ANSWER 7 OF 12 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 4
AN 1995:202828 CAPLUS
DN 122:19538
TI Electron-energy-loss spectroscopy of mass-selected ion-beam-deposited diamondlike carbon
AU Kulik, J.; Lifshitz, Y.; Lempert, G. D.; Rabalais, J. W.; Marton, D.
CS Texas Cent. Superconductivity, Univ. Houston, Houston, TX, 77204, USA
SO J. Appl. Phys. (1994), 76(9), 5063-9
CODEN: JAPIAU; ISSN: 0021-8979
DT Journal
LA English
AB Amorphous diamondlike C (DLC) films grown by low-energy mass-selected ion-beam deposition were examd. by EELS. Films grown using deposition energies of 50, 120, and 300 eV were studied. For these deposition energies, all films exhibit similar EELS characteristics indicating a very high degree of sp^3 bonding. The bulk plasmon

resonance is intermediate between that of graphite and that of diamond; however, the properties of the low-energy-loss spectra of the **DLC** films are more similar to those of diamond. The near-K-edge C EELS data from the films exhibit a π^* feature which is much smaller than that of graphite or evapd. C. The use of previously proposed computational methods on the near-K-edge EELS data indicates that over 80% of the C atoms are sp^3 bonded. The size of the π^* feature is larger for smaller **plasmon** energies, as expected. The present data are in accord with other analyses of similar films that indicate a broad (apprx.30-300 eV) energy window for diamondlike film formation.

L5 ANSWER 8 OF 12 CAPLUS COPYRIGHT 2000 ACS

AN 1994:522306 CAPLUS

DN 121:122306

TI Electronic density of states and deep defects of hydrogenated amorphous carbon (a-C-H)

AU Schaefer, J.; Ristein, J.; Ley, L.

CS Institut fuer Technische Physik, Universitaet Erlangen, Erwin-Rommel-Strasse 1, Erlangen, D-91058, Germany

SO Diamond Relat. Mater. (1994), 3(4-6), 861-4

CODEN: DRMTE3

DT Journal

LA English

AB R.f. plasma CVD was used to prep. hydrogenated amorphous C (a-C-H) films with properties ranging from polymer-like to diamond-like C (**DLC**) depending on self bias ranging from 0 to 200 V. The films were characterized by their C 1s **plasmon** loss which yields the d. and by optical properties such as the refractive index and the optical gap which decreases from 4.0 to 1.9 eV on bias. UV photoemission spectra were used to derive relative sp^2 -contents which increase from 14% for polymer-like material to 37% for **DLC**. Two defect bands in the pseudogap with binding energies of 1.8 eV and 0.8 eV and an integrated electron d. that increases with bias from 1 .times. 10^{20} cm⁻³ to 7 .times. 10^{20} cm⁻³ were identified with photoelectron yield spectroscopy. Transient changes in the deep defects of **DLC** on illumination with 680 nm wavelength light were obsd. and are discussed.

L5 ANSWER 9 OF 12 SCISEARCH COPYRIGHT 2000 ISI (R)

AN 94:338897 SCISEARCH

GA The Genuine Article (R) Number: NN160

TI ELECTRONIC DENSITY-OF-STATES AND DEEP DEFECTS OF HYDROGENATED AMORPHOUS-CARBON (A-C-H)

AU SCHAFFER J (Reprint); RISTEIN J; LEY L

CS UNIV ERLANGEN NURNBERG, INST TECH PHYS, ERWIN ROMMEL STR 1, D-91058 ERLANGEN, GERMANY (Reprint)

CYA GERMANY

SO DIAMOND AND RELATED MATERIALS, (APR 1994) Vol. 3, No. 4-6, pp. 861-864. ISSN: 0925-9635.

DT Article; Journal

FS ENGI

LA ENGLISH

REC Reference Count: 12

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB R.f. plasma chemical vapour deposition was used to prepare hydrogenated amorphous carbon (a-C:H) films with properties ranging from polymer-like to diamond-like carbon (**DLC**) depending on self bias ranging from 0 to 200 V. The films were characterized by their C 1s **plasmon** loss which yields the density and by optical properties such as the refractive index and the optical gap which decreases from 4.0 to 1.9 eV on bias. UV photoemission spectra were used to derive relative sp -contents which increase from 14% for polymer-like material to 37% for **DLC**. Two defect bands in the pseudogap with binding energies of 1.8 eV and 0.8 eV and an integrated electron density that increases with bias from 1×10^{20} cm⁻³ to 7×10^{20} cm⁻³ were identified with photoelectron yield spectroscopy. Transient changes in the deep defects of **DLC** on illumination with 680 nm wavelength light were observed and are discussed.

L5 ANSWER 10 OF 12 CAPLUS COPYRIGHT 2000 ACS

AN 1994:64898 CAPLUS

DN 120:64898
TI Electron energy-loss spectral and Raman spectral study of diamond and diamond-like carbon films
AU Sun, Biwu; Xie, Kan; Zhao, Tienan; Liu, Jingqing; Qi, Shangxue; Zhang, Xiaoping; Gao, Ziqiang; Lin, Zhangda
CS Inst. Phys., Acad. Sin., Beijing, 100080, Peop. Rep. China
SO Bandaoti Xuebao (1992), 13(11), 653-60
CODEN: PTTDPZ; ISSN: 0253-4177
DT Journal
LA Chinese
AB Electron energy-loss spectroscopy (EELS) was applied to the anal. of diamond films (DF), diamond-like films (DLC), and graphite. The main energy-loss peaks for DF are the surface and bulk **plasmon** energy losses at 23 and 34 eV, resp., and the interband transitions at 5.4 eV. The characteristic energy loss features of DLC are π and $(\pi + \sigma)$ electron bulk **plasmon** energy losses at 4.5 and 22.4 eV, resp., and interband transition of 13 eV. The energy loss peaks for graphite are the π electron **plasmon** energy loss at 6 eV, interband transition and C-axis **plasmon** at 13 eV, and energy losses at 20 and 25.6 eV caused by C-axis **plasmon** and **plasmon** in the basal plane, resp. The EELS and Raman spectrum of DLC with H were compared with that of DLC without H. The ratios of sp³ to sp² C sites in DLC both with and without H, and in the second phase DLC of diamond films were calcd. according to the π and $(\pi + \sigma)$ electron **plasmon** energy losses. The ratios of the intensity of π to $(\pi + \sigma)$ loss peak were used to est. the relative content of the second phase DLC in diamond films.

L5 ANSWER 11 OF 12 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 5
AN 1992:538118 CAPLUS
DN 117:138118
TI The structure of highly tetrahedral amorphous diamond-like carbon. III. Study of inhomogeneity by high-resolution inelastic scanning transmission electron microscopy
AU Yuan, J.; Saeed, A.; Brown, L. M.; Gaskell, P. H.
CS Cavendish Lab., Univ. Cambridge, Cambridge, CB3 0HE, UK
SO Philos. Mag. B (1992), 66(2), 187-97
CODEN: PMABDJ; ISSN: 0958-6644
DT Journal
LA English
AB Microscopic inhomogeneity in a highly-tetrahedral amorphous diamond-like carbon (a-DLC) thin film was investigated by high-resoln. energy-filtered imaging of inelastically scattered electrons in a scanning transmission electron microscope. The nondiamond-like carbon materials were revealed by their lack of an optical gap, and by their lower-valence **plasmon** excitation energies. Disk-like carbon inclusions were found embedded in the diamond-like matrix, and were mostly sp² bonded. The d. of these defects was small, but, in an atypical case, the proportion of nondiamond-like carbon was as high as 50% with two carbon phases closely interwoven. The thin edges of these films were mostly graphitic. The results are discussed with respect to the growth mechanism of a-DLC films.

L5 ANSWER 12 OF 12 CAPLUS COPYRIGHT 2000 ACS
AN 1987:204544 CAPLUS
DN 106:204544
TI Comparison of the carbon KLL first-derivative Auger spectra from XPS and AES using diamond, graphite, silicon carbide and diamond-like-carbon films
AU Mizokawa, Yusuke; Miyasato, Tatsuro; Nakamura, Shogo; Geib, Kent M.; Wilmsen, Carl W.
CS Coll. Integrated Arts Sci., Univ. Osaka Prefect., Sakai, 591, Japan
SO Surf. Sci. (1987), 182(3), 431-8
CODEN: SUSCAS; ISSN: 0039-6028
DT Journal
LA English
AB The C KLL 1st-deriv. Auger spectra obtained by numerically differentiating the XPS N(E) line gives a better fine-structure fingerprint of the C state than conventional AES. The 1st-deriv. of the x-ray excited (XAES) CKLL

spectrum from a diamond-like-C (DLC) film exhibited almost the same spectrum as both XAES and AES spectra from natural diamond. However, the AES spectrum of the DLC film indicated a graphite-like structure due to electron beam damage. Comparison of the XAES and AES spectra suggested that the electron beam used in conventional AES partially changed the plasmon loss structure of C in diamond, graphite and β -SiC as well.

=> s dlc and waveguide

L6 10 DLC AND WAVEGUIDE

=> dup rem 16

PROCESSING COMPLETED FOR L6

L7 7 DUP REM L6 (3 DUPLICATES REMOVED)

=> d 17 bib ab 1-7

L7 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2000 ACS

AN 1998:614558 CAPLUS

DN 129:237967

TI Apparatus for deposition of diamond-like carbon

IN Sakamoto, Yuichi; Tada, Shigekazu; Saito, Hiroki

PA Nichimen Electronics koken K. K., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10251855	A2	19980922	JP 1997-61263	19970314
	JP 3009371	B2	20000214		

AB In the title app., microwaves travel in a **waveguide**, go through a window, are guided into a reaction room, and form plasma in the reaction chamber. The inner surface of the window may be concave and a hot air is guided onto the outside surface of the window. Plasma reaction products do not deposit onto the inner surface of the window so that the window is always kept clean because of the hot air.

L7 ANSWER 2 OF 7 CAPLUS COPYRIGHT 2000 ACS

AN 1997:747737 CAPLUS

DN 128:67751

TI Protective optical coatings

AU Martinez-Duart, J. M.; Vazquez, L.; Sanchez, O.; Bueno, R. M.;

Gutierrez-Llorente, A.; Martin-Palma, R. J.; Garcia-Ayuso, G.

CS Dept. Fisica Aplicada, Univ. Autonoma de Madrid, Madrid, 28049, Spain

SO Proc. Int. Conf. Vac. Web Coat. 10th (1996), 170-183. Editor(s): Bakish, Robert. Publisher: Bakish Materials Corp., Englewood, N. J.

CODEN: 65IAAF

DT Conference; General Review

LA English

AB At present there are numerous new applications of protective optical coatings as diverse as coatings for the IR, optical coatings on polymeric materials, coatings for power lasers, solar energy conversion systems, **waveguides**, architectural windows, etc. The mech. properties of these coatings-hardness, stress, adhesion, etc.-have an important role in their performance. Si oxynitrides, diamond, **DLC**, oxides, Ti nitride, etc. are currently employed as materials for protective optical coatings. Among them, specially important is the case of oxynitride coatings, which can be produced with excellent mech. properties and varying indexes of refraction in the $1.5 < n < 2.0$ interval. These coatings are also excellent for the protection of optical components against the adverse action of moisture. Most of the optical coatings considered in this paper are deposited by advanced techniques operating at relatively low temps. (usually $< 250^\circ\text{C}$.) and producing dense, adherent films with

suitable optical and mech. properties. A review with 22 refs.

L7 ANSWER 3 OF 7 CAPLUS COPYRIGHT 2000 ACS
AN 1995:678225 CAPLUS
DN 123:273231
TI Diamond-like carbon film deposition by super-wide electron-cyclotron resonance plasma source excited by traveling microwave
AU Ishii, A.; Amadatsu, S.; Sakaguchi, Y.; Minomo, S.; Taniguchi, M.; Sugiyo, M.; Kobayashi, T.
CS Powersource and Device Department, DAIHEN Corporation, Osaka, 532, Japan
SO Trans. Mater. Res. Soc. Jpn. (1994), 14B(Magnetic, Fullerene, Dielectric, Ferroelectric, Diamond and Related Materials), 1595-8
CODEN: TMRJE3
DT Journal
LA English
AB An electron-cyclotron resonance (ECR) plasma source which generates 500 mm wide plasma was developed. The plasma is generated by a 2.45 GHz traveling microwave which is supplied through a long slot antenna prepd. in the **waveguide** in a divergent magnetic field generated by permanent magnets and a solenoid coil. Diamond-like C (**DLC**) films were deposited in a wide zone 320 mm in width. The breakdown field was .apprx.8.4 .times. 10⁶ V/cm and permittivity, 3.89. The prepd. Al/**DLC**/Si metal/insulator/semiconductor (MIS) diode revealed fairly good field effect in its capacitance-voltage curve.

L7 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 1
AN 1994:568241 CAPLUS
DN 121:168241
TI Super-wide electron cyclotron resonance plasma source excited by traveling microwave as an efficient tool for diamondlike carbon film deposition
AU Ishii, A.; Amadatsu, S.; Minomo, S.; Taniguchi, M.; Sugiyo, M.; Sakaguchi, Y.; Kobayashi, T.
CS Powersource and Device Dep., DAIHEN Corp., Osaka, 532, Japan
SO J. Vac. Sci. Technol., A (1994), 12(4, Pt. 1), 1241-3
CODEN: JVTAD6; ISSN: 0734-2101
DT Journal
LA English
AB An electron cyclotron resonance (ECR) plasma source which generates 500-mm-wide plasma has been developed. A divergent magnetic field sufficient for ECR is generated by permanent magnets and a solenoid coil. A 2.45-GHz traveling microwave is supplied through a long slot antenna prepd. in the sidewall of the **waveguide** and excites ECR plasma. This app. is applied to the diamondlike carbon (**DLC**) films deposition and **DLC** films were deposited in a wide zone 320 mm in width.

L7 ANSWER 5 OF 7 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 2
AN 1994:591682 CAPLUS
DN 121:191682
TI Characterization of diamondlike carbon films grown by super-wide electron-cyclotron resonance plasma assisted chemical vapor deposition
AU Ishii, A.; Amadatsu, S.; Minomo, S.; Taniguchi, M.; Sugiyo, M.; Kobayashi, T.
CS Powersource and Device Department, DAIHEN Corp., Osaka, 532, Japan
SO J. Vac. Sci. Technol., A (1994), 12(4, Pt. 1), 1068-71
CODEN: JVTAD6; ISSN: 0734-2101
DT Journal
LA English
AB An electron-cyclotron resonance plasma source that generates 500-mm-wide plasma was developed. The plasma is generated by a 2.45-GHz traveling microwave which is supplied through a long slot antenna prepd. in the **waveguide** in a divergent magnetic field generated by permanent magnets and a solenoid coil. Diamondlike C (**DLC**) films were deposited in a zone 320 mm wide. The breakdown field was 8.4 .times. 10⁶ V/cm and permittivity, 3.89. The prepd. Al/**DLC**/Si MIS diode had a fairly good field effect in its capacitance-voltage curve.

L7 ANSWER 6 OF 7 CAPLUS COPYRIGHT 2000 ACS DUPLICATE 3
AN 1993:483089 CAPLUS

DN 119:83089
TI Diamond-like carbon film deposition by super-wide electron-cyclotron
resonance plasma source excited by traveling microwave
AU Ishii, Akira; Sakaguchi, Yoshiyuki; Minomo, Shoichiro; Taniguchi, Michio;
Sugiyo, Masato; Kobayashi, Takeshi
CS DAIHEN Corp., Osaka, 532, Japan
SO Jpn. J. Appl. Phys., Part 2 (1993), 32(6A), L802-L805
CODEN: JAPLD8; ISSN: 0021-4922
DT Journal
LA English
AB An electron-cyclotron resonance (ECR) plasma source which generates a long
and narrow plasma 500 mm in length was developed. The plasma is generated
by a 2.45 GHz traveling microwave which is supplied through a slot antenna
prepd. in the **waveguide** in a magnetic field generated by
permanent magnets. Diamond-like C (DLC) films were deposited in
a wide zone 340 mm in width. The variation of film thickness was less
than 10%. The resistivity of the DLC film was .apprx.9.62
.times. 10¹¹ .OMEGA..cm and permittivity 3.63. The prepd. Al/DLC
/Si metal/insulator/semiconductor (MIS) diode revealed fairly good field
effect in its capacitance-voltage curve.

L7 ANSWER 7 OF 7 CAPLUS COPYRIGHT 2000 ACS
AN 1991:174539 CAPLUS
DN 114:174539
TI Electron cyclotron resonance radio-frequency hybrid plasma deposited
diamondlike carbon as an optical material
AU Sritharan, S.; Wilson, J. S.; Barbier, P. R.; Pankove, J. I.
CS Optoelectron. Comput. Syst. Cent., Univ. Colorado, Boulder, CO, 80309, USA
SO Proc. SPIE-Int. Soc. Opt. Eng. (1990), 1325(Diamond Opt. 3), 253-7
CODEN: PSISDG; ISSN: 0277-786X
DT Journal
LA English
AB Diamondlike carbon (DLC) is deposited by electron cyclotron
resonance radio-frequency (ECR-RF) hybrid plasma method. The films are
hard with optical bandgap ranges between 1.1 and 1.8 eV depending on the
deposition parameters. **Waveguide** structures were fabricated in
DLC using liftoff technique. The films are also characterized by
electron energy loss spectroscopy and Raman spectroscopy.

=> s dlc and optical properties

L8 148 DLC AND OPTICAL PROPERTIES

=> s l8 and refractive index

L9 36 L8 AND REFRACTIVE INDEX

=> dup rem 19

PROCESSING COMPLETED FOR L9

L10 29 DUP REM L9 (7 DUPLICATES REMOVED)

=> s l10 and py<1997

1 FILES SEARCHED...

L11 16 L10 AND PY<1997

=> d l11 bib ab 1-16

L11 ANSWER 1 OF 16 CAPLUS COPYRIGHT 2000 ACS
AN 1997:659190 CAPLUS
DN 127:339378
TI Spectro-ellipsometric studies of structure and **optical**
properties of plasma-grown DLC films
AU Rhee, Sung-Gyu; Lee, Soonil; Oh, Soo-Ghee; Lee, Kwang-Ryeol
CS Dep. Phys., Ajou Univ., Suwon, 442-749, S. Korea
SO Han'guk Pyomyon Konghak Hoechi (1996), 29(5), 532-539

PB. Korean Institute of Surface Engineering

DT Journal

LA English

AB Diamond-like C (DLC) films were deposited on Si substrates by the plasma decompn. of hydrocarbons under various conditions, and studied by the spectroscopic ellipsometry (SE). The authors used the effective medium approxn. with the dispersion model developed by Forouhi and Bloomer to det. simultaneously both the structure and the optical consts. of the DLC films from their ellipsometric spectra. Esp., the authors studied the variation of the multilayer structure including the interface layer, of the **refractive indexes**, and of the extinction coeffs. as the deposition conditions were varied; substrate pretreatment procedure, hydrocarbon precursors, and the substrate bias voltage were varied.

L11 ANSWER 2 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1997:441065 CAPLUS

DN 127:168275

TI Study on **optical properties** of diamond-like carbon thin films

AU Wang, Guihua; Wang, Guangming; Yang, Weiyi

CS Department of Optical-Electron Technology, Nanjing University of Science and Technology, Nanjing, 210094, Peop. Rep. China

SO Zhenkong Kexue Yu Jishu (1996), 16(5), 336-341

CODEN: CKKSDV; ISSN: 0253-9748

PB Zhenkong Kexue Yu Jishu Zazhishe

DT Journal

LA Chinese

AB Diamond-like C [DLC] films were deposited on Ge substrates by radiofrequency-plasma decompn. of CH₄. The **refractive index**, the IR transmittance, and the absorption of the DLC films were studied. The DLC films deposited under various conditions with a **refractive index** of .apprx.2 were ideal anti-reflection coatings for Ge. FTIR spectroscopy measurements showed that Ge disks coated with DLC films on both sides have a transmittance of 94.5% at the wavelength of 10.6 .mu.m. Ge Disks 100 mm in diam. deposited with DLC films 1.3 .mu.m thick on both sides showed a transmittance of 93.9% at the center and a transmittance of .apprx.92.1% at the 5 spots from the center, showing good uniformity of the films and stability of the coating technique. The absorption coeff. curves at 2.5-25 .mu.m were given by computing programs. The absorption of the DLC films the lowest at .apprx.3.8 .mu. (e.g. .alpha. 10.cm-1 at .lambda. = 3.8 .mu.m) and 600 cm-1 at .lambda. = 10.6 .mu.m. The curve was well explained with valence vibration.

L11 ANSWER 3 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1996:393418 CAPLUS

DN 125:100521

TI Diamond-like carbon films grown by very high frequency (100 MHz) plasma enhanced chemical vapor deposition technique

AU Kumar, Sushil; Dixit, P. N.; Sarangi, D.; Bhattacharyya, R.

CS Thin Film and Amorphous Materials Group, National Physical Laboratory, New Delhi, 110 012, India

SO Appl. Phys. Lett. (1996), 69(1), 49-51

CODEN: APPLAB; ISSN: 0003-6951

DT Journal

LA English

AB Diamond-like C films were grown by VHF-PECVD technique. Since the self-bias potential developed in a VHF plasma is very low, sufficiently high neg. d.c. voltage was applied to the substrates to make DLC film being grown reasonably hard. Also a comparative study of VHF grown films was made with radio-frequency (13.56 MHz) discharge grown films (grown in the same PECVD reactor). This made it possible to study the specific effects of excitation frequency while keeping other parameters const. Deposition rate (rd) is .apprx.5 times higher for VHF grown films. Marginal variation in optical band gap (Eg) and **refractive index** (n) were obsd. in VHF grown films with variation in deposition parameters. Max. value of hardness recorded was 1500 kg/mm² in

the case of radio-frequency and 902 kg/mm² in the case of VHF grown films, within the range of deposition parameters. Stress values were in the range 1.7 .times. 10⁹ - 2.9 .times. 10⁹ Nm⁻² for VHF and 3.6 .times. 10⁹ - 4.6 .times. 10⁹ Nm⁻² for radio-frequency grown films.

L11 ANSWER 4 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1996:297175 CAPLUS

DN 125:72705

TI Nanocrystalline C = N thin films

AU Szmids, J.; Werbowy, A.; Zdunek, K.; Sokowska, A.; Konwerska-Hrabowska, J.; Mitura, S.

CS Institute of Microelectronics and Optoelectronics, Warsaw University of Technology, Koszykowa 75, Warsaw, 00-662, Pol.

SO Diamond Relat. Mater. (1996), 5(3-5), 564-569

CODEN: DRMT3; ISSN: 0925-9635

DT Journal

LA English

AB This paper discusses phase compn. as well as elec. and **optical properties** of carbon-nitrogen (CN) compd. obtained by reactive pulse plasma method. Material produced in such a way is a mixt. of an amorphous compd. which the authors have called polycyanoimine and nanocryst. diamond. Its elec. and **optical properties** differ from those of DLC obtained by the same method. During elec. measurements there were not obsd. diode-like current-voltage (I-V) characteristics, what rules out the possibility that nitrogen atoms might act as a dopant in obtained material. Elec. resistivity of studied films, as ranging from 10⁹ to 10¹¹ .OMEGA.cm, was higher than that of DLC layers produced from pulse plasma. However, subsequent low temp. (350.degree.) annealing resulted in the drop of their resistivity to the value of 10⁶-10⁷ .OMEGA.cm, the same as for DLC materials. Annealing has also influenced **refractive index** of studied layers resulting in its increase from 1.9 to 2.13. Also, CN layers produced under the highest nitrogen pressure(i.e. 60 Pa) were luminescent when illuminated with 514.5 nm laser beam, which does not occur in the case of DLC.

L11 ANSWER 5 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1996:144033 CAPLUS

DN 124:214755

TI Determination of stress of DLC films from below band gap optical absorption measurements

AU Basu, M.; Dutta, J.; Chaudhuri, S.; Pal, A. K.; Nakayama, M.

CS Dep. Mater. Sci., Indian Assoc. Culvit. Sci., Calcutta, 700 032, India

SO Vacuum (1996), 47(3), 233-8

CODEN: VACUAV; ISSN: 0042-207X

DT Journal

LA English

AB Diamond like carbon (DLC) films were deposited (thickness .apprx. 100-130 nm) by RF plasma CVD of ethylene on to mica and silicon substrates at room temp. **Optical properties** of the films deposited at different neg. self bias (VB) voltages (0 to -805 V) were measured. The **refractive index** (n) and extinction coeff. (k) of DLC films on mica varied within 1.6-2.1 and 0.035-0.128, resp. while the band gap energy (Eg) decreased from 2.38 to 2.01 eV with increase in VB from 0 to -805 V. The internal stress (compressive in nature) of these films (on mica) along with that of films deposited by sputtering of vitreous carbon target (on glass) was obtained from the broadening of the optical absorption band tail. The stress on mica (0.2-1.0 GPa) was obsd. to be comparable to the stress on silicon substrates, measured by the flexure of beam technique. The hardness of DLC films on mica varied within 6.5-8 GPa while that on Si varied within 6-9.5 GPa. The hardness of sputtered films on glass substrate was .apprx. 8.7 GPa.

L11 ANSWER 6 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1995:1005672 CAPLUS

DN 124:69993

TI Precursor gas effect on the mechanical and **optical properties** of ion beam deposited diamond-like carbon films

AU Oh, Je Uk; Lee, Kwang-Baeol; Eun, Kwang Yong
CS Division of Ceramics, Korea Institute of Science and Technology, P.O. Box
131, Cheongryang, Seoul, 130-650, S. Korea
SO Thin Solid Films (1995), 270(1-2), 173-6
CODEN: THSFAP; ISSN: 0040-6090
DT Journal
LA English
AB The effect of precursor gases on the diamond-like C (DLC) film
deposition was studied by the direct ion beam deposition method.
DLC films were deposited using methane and benzene as the
precursor gases. Ion energies for the deposition range from 100 to 700 eV
were achieved by adjusting the beam voltage. The residual stresses,
refractive indexes and optical band gaps were compared
at the same ion energy. The authors obsd. significant differences in
residual stress and **optical properties** between these
films. As in r.f. plasma-assisted CVD, the residual stresses of the films
deposited from benzene show a characteristic behavior of lower ion energy
deposition than those deposited from methane. The present observations
are discussed in terms of the difference in ion energy per C atom at the
growth surface. Also the Ar addn. effect on the residual stress is
strongly dependent on the precursor gases.

L11 ANSWER 7 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1995:678221 CAPLUS

DN 123:271672

TI Electrical and **optical properties** of pulsed laser
ablated diamond-like carbon films

AU Leppavuori, S.; Levoska, J.

CS Microelectronics and Material Physics Laboratories, University Oulu, Oulu,
FIN - 90571, Finland

SO Trans. Mater. Res. Soc. Jpn. (1994), 14B(Magnetic, Fullerene,
Dielectric, Ferroelectric, Diamond and Related Materials), 1579-82
CODEN: TMRJE3

DT Journal

LA English

AB Amorphous diamond-like C (DLC) thin films were deposited on
fused SiO₂ and single crystal Si substrates by pulsed laser ablation using
a focused beam from an XeCl excimer laser and a pyrolytic graphite target.
The structure and properties of the films were studied by SEM, x-ray
diffraction, micro-Raman and FTIR spectroscopy, elec. cond. and optical
measurements. By varying the peak power d. of the laser beam 109-1010
W/cm² and the deposition temp. between room temp. and 200.degree. it is
possible to tailor the properties of the deposited films between the
extremes of diamond-like and graphite-like C. The optical band gap of the
films varied from zero (graphite-like films) to a max. value of 1.35 eV (
DLC). By introducing H into the chamber during deposition, the
DLC band gap could be increased to 2.2 eV. The real part (n) of
the visible wavelength **refractive index** ranged 2.4-2.5
for good quality DLC films. The imaginary part (k) of the
refractive index was highest at short wavelengths, and
reduced when approaching the near-IR region. It was possible to vary the
elec. cond. of the unhydrogenated films by 8 orders of magnitude between
DLC and graphite-like material. The cond. of the DLC
films exhibited an exp(-T-1/4) dependence on temp. which is characteristic
for amorphous semiconductors.

L11 ANSWER 8 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1995:364647 CAPLUS

DN 122:227710

TI Effect of laser power density and deposition temperature on electrical and
optical properties of pulsed laser ablated diamond-like
carbon films

AU Levoska, J.; Leppaevuori, S.

CS Microelectronics and Material Physics Laboratories, University of Oulu,
P.O. Box 400, Oulu, FIN-90571, Finland

SO Appl. Surf. Sci. (1995), 86(1-4), 180-4
CODEN: ASUSEE; ISSN: 0169-4332

DT Journal

LA English

AB Amorphous diamond-like C (DLC) thin films were deposited by pulsed laser ablation using an XeCl excimer laser and an electrolytic graphite target. The effect of the laser power d. and the substrate temp. on the optical and elec. properties of the films was studied. It is possible to tailor the elec. and **optical properties** of the deposited films between diamond-like and graphite-like by varying the peak power d. of the laser beam and the deposition temp. The optical band gap of the films varied from zero (deposition temp. $\leq 200^\circ\text{C}$) to a max. value of 1.35 eV. The real part n of the visible wavelength **refractive index** ranged from 2.4 to 2.5 for good quality DLC films. It was possible to vary the elec. cond. by eight orders of magnitude between DLC and graphite-like material. The cond. of the DLC films exhibited an $\exp(-T^{-1/4})$ dependence on temp. that is characteristic of hopping mechanisms; graphite-like films showed more band-type cond.

L11 ANSWER 9 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1994:522306 CAPLUS

DN 121:122306

TI Electronic density of states and deep defects of hydrogenated amorphous carbon (a-C-H)

AU Schaefer, J.; Ristein, J.; Ley, L.

CS Institut fuer Technische Physik, Universitaet Erlangen, Erwin-Rommel-Strasse 1, Erlangen, D-91058, Germany

SO Diamond Relat. Mater. (1994), 3(4-6), 861-4
CODEN: DRMTE3

DT Journal

LA English

AB R.f. plasma CVD was used to prep. hydrogenated amorphous C (a-C-H) films with properties ranging from polymer-like to diamond-like C (DLC) depending on self bias ranging from 0 to 200 V. The films were characterized by their C 1s plasmon loss which yields the d. and by **optical properties** such as the **refractive index** and the optical gap which decreases from 4.0 to 1.9 eV on bias. UV photoemission spectra were used to derive relative sp²-contents which increase from 14% for polymer-like material to 37% for DLC. Two defect bands in the pseudogap with binding energies of 1.8 eV and 0.8 eV and an integrated electron d. that increases with bias from 1 .times. 10²⁰ cm⁻³ to 7 .times. 10²⁰ cm⁻³ were identified with photoelectron yield spectroscopy. Transient changes in the deep defects of DLC on illumination with 680 nm wavelength light were obsd. and are discussed.

L11 ANSWER 10 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1994:110732 CAPLUS

DN 120:110732

TI Study of the **optical properties** of diamond-like coatings prepared by laser-arc

AU Scheibe, H. J.; Ristau, D.; Rahe, M.

CS Fraunhofer Einrichtung Werkstoffphys. Schichttechnol., Dresden, 0-8027, Germany

SO Diamond Relat. Mater. (1993), 2(11), 1424-9
CODEN: DRMTE3

DT Journal

LA English

AB The laser-arc as a controlled pulsed arc plasma source was used to prep. diamond-like C coatings (DLC) for optical applications. DLC films with a thickness of ≤ 500 nm were deposited on different substrate materials (ZnSe, NaCl, KCl, Ge) using special prepn. techniques for enhancing the substrate-film adhesion. Coating was performed at room temp. in a vacuum of 10⁻⁴ Pa. A special moving substrate holder was used to deposit an all-round protective DLC that covered the complete surface of the salt substrates including the rims. The **optical properties** of the coating were detd. by spectrophotometry and laser calorimetry. The **refractive indexes** were calcd. based on the photometric transmission measurements. The optical absorption at 10.6 μm ranges from 200 to 900/cm, and depends on the film thickness and on the substrate material. The results demonstrate that the controlled arc evapn. by laser-arc is

suitable for the prepn. of **DLC** with optical quality.

L11 ANSWER 11 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1992:48137 CAPLUS

DN 116:48137

TI Investigation on the **DLC** films prepared by dual-ion beam sputtering deposition

AU Wang, Tianmin; Wang, Weijie; Liu, Guidng; Huang, Liangpu; Luo, Chuntai; Liu, Dingquan; Xu, Ming; Yang, Yimin

CS Dep. Mater. Sci., Lanzhou Univ., Lanzhou, 730001, Peop. Rep. China

SO Proc. SPIE-Int. Soc. Opt. Eng. (1991), 1519(Int. Conf. Thin Film

Phys. Appl., 1991, Pt. 2), 890-900

CODEN: PSISDG; ISSN: 0277-786X

DT Journal

LA English

AB Diamond-like C (**DLC**) films were successfully deposited onto Si, glass, Mo and stainless steel substrates at <50.degree. by dual-ion beam sputtering deposition. The influences of the bombarding ion beam energy, the bombarding ion beam c.d. and the ratio of H to Ar gas flow in the bombarding ion source on the properties and structures of films were investigated. The deposited films are composed of SP3 bond and SP2 bonds with bond-angle disorder. Depending on processing parameters and substrate, the predominant phase would be amorphous C, micrographite crystals or microcubic diamond crystals. With an increase of the parameters described above the elec. resistivity of the films and the relative transmittance vs. wavelength curves of deposited glasses in IR region (1.5-5.5 .mu.m) have tendency to increase 1st and then to decrease. The resistivities of the films deposited on Si, Mo and stainless steel range from 107 to 1012 .OMEGA. cm. While on glass substrate, the square elec. resistivity varies from 105 to 109 .OMEGA./box., the **refractive index** ranges from 1.1 to 2.6. The films and substrate have good adhesion force and the values between films and Si, Mo substrate are about 8-14 kg/mm2.

L11 ANSWER 12 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1991:255889 CAPLUS

DN 114:255889

TI Properties of reactively-deposited silicon carbide (SiC) and germanium carbide (GeC) alloys

AU Martin, P. M.; Johnston, J. W.; Bennett, W. D.

CS Pac. Northwest Lab., Richland, WA, 99352, USA

SO Proc. SPIE-Int. Soc. Opt. Eng. (1990), 1323(Opt. Thin Films 3), 291-8

CODEN: PSISDG; ISSN: 0277-786X

DT Journal

LA English

AB Thin-film SixCl-x and GexCl-x alloy coatings with low IR optical absorption were fabricated by d.c.- and radiofrequency-reactive magnetron sputtering. The optical and mech. properties of the coatings depend on compn. detd. by deposition conditions. The **refractive index** and optical absorption coeff. of SixCl-x alloys were varied from those of amorphous Si to those near diamond-like C (**DLC**) by increasing C content. The band edge shifted <1.2 eV with C content as .ltoreq.0.8. The useful range of the SixCl-x coatings was extended to wavelengths .gtoreq.1 .mu.m. The useful transparency range of GexCl-x coatings is 3-12 .mu.m. The **refractive index** of GexCl-x coatings was varied from 4.2 of amorphous Ge to near 3.4 by increasing x from 0 to 0.5. The optical absorption coeff. was a complex function of compn. and C-H, Ge-H, and Ge-C bonding. Mech. stress in both materials was generally moderate, and increased with increasing C content for the GeC alloys and decreased with increasing C for the SiC alloys. The wide range of **optical properties** obtainable for both coating types makes them useful in many types of multilayer designs. Abrasion-resistant IR multispectral antireflection coatings on ZnS were demonstrated using Ge0.9C0.1 and **DLC** layers.

L11 ANSWER 13 OF 16 CAPLUS COPYRIGHT 2000 ACS

AN 1989:643818 CAPLUS

DN 111:243818

TI Synthesis and characterization of diamond-like carbon films using ion beam technique
AU Wu, Richard L. C.
CS Universal Energy Syst., Inc., Dayton, OH, 45432, USA
SO Mater. Res. Soc. Symp. Proc. (1989), 152(Opt. Mater.: Process. Sci.), 33-7
CODEN: MRSPDH; ISSN: 0272-9172
DT Journal
LA English
AB Diamond-like carbon (DLC) coatings were deposited on several IR transmitting substrates utilizing the ion beam deposition technique. Optimum deposition parameters were established as a function of source gas compn., source pressure, ion-impact energy, substrate material and cleaning substrate procedures. Extensive characterization of the DLC films was also performed. Rutherford backscattering and proton recoil techniques were used to analyze C and H content and impurities. These films contain 70% at. C and 30% at. H. Transmission electron microscopy was used to analyze the crystallinity, void structure and surface microstructure, which were found to be amorphous and dense. **Optical properties**, such as **refractive index** and extinction coeff., were measured using transmission/reflection spectroscopy, ellipsometry and laser calorimetry. Environmental testing was performed using various acids and solvents. The thermal stability and moisture penetration on these **DLC** films were extensively investigated. The effect of high ion energy radiation on **DLC** films was studied. Details of the prepn. method and characterization of **DLC** films are presented.

L11 ANSWER 14 OF 16 CAPLUS COPYRIGHT 2000 ACS
AN 1976:127990 CAPLUS
DN 84:127990
TI Anodic behavior of iron in sodium sulfate solutions containing fatty acids
AU Mrowczynski, G.; Szklarska-Smialowska, Susan
CS Inst. Phys. Chem., Pol. Acad. Sci., Warsaw, Pol.
SO Br. Corros. J. (1975), 10(4), 192-5
CODEN: BCRJA3
DT Journal
LA English
AB The effect of some fatty acids (caproic, caprylic, capric) on the anodic behavior of Fe in de-aerated 0.005M Na2SO4 solns. of pH 6-12 was studied by ellipsometry and by measurements of the double layer capacitance (**dlc**). At certain concns. of added fatty acids (e.g., caprylic acid at a concn. of 2 .times. 10⁻² mole/l.) the rate of anodic dissoln. of Fe and the **dlc** are both decreased. The most efficient inhibition is obsd. at pH 6. The surface films formed in solns. at pH 6 exhibit complex indices of refraction, $n = (2.6 \pm 0.2) \{1 - (0.16i \pm 0.02i)\}$ and grow according to a log. law. Similar **optical properties** and film growth kinetics are found for films formed in similar solns. at pH 12. These films are composed of Fe oxide. At potentials below 500 mVvs. normal H electrode, an increase of pH in the range 6-10 causes a decrease in inhibitive efficiency of the fatty acids, an increase of **dlc**, and the formation of non-protective films with low **refractive indices**. At potentials above 500 mV the surface films are protective irrespective of the pH of the soln.

L11 ANSWER 15 OF 16 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 95:662490 SCISEARCH
GA The Genuine Article (R) Number: RV828
TI DIAMOND-LIKE CARBON-FILMS GROWN USING A SADDLE FIELD SOURCE
AU PANWAR O S (Reprint); SARANGI D; KUMAR S; DIXIT P N; BHATTACHARYYA R
CS NATL PHYS LAB, THIN FILM & AMORPHOUS MAT GRP, DR KS KRISHNAN RD, NEW DELHI 110012, INDIA (Reprint)
CYA INDIA
SO JOURNAL OF VACUUM SCIENCE & TECHNOLOGY A-VACUUM SURFACES AND FILMS, (SEP/OCT 1995) Vol. 13, No. 5, pp. 2519-2524.
ISSN: 0734-2101.
DT Article; Journal
FS PHYS; ENGI

LA ENGLISH

REC Reference Count: 26

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB This article reports the measurement of deposition rate, dark conductivity versus temperature, optical band gap, **refractive index**, extinction coefficient, hardness, adhesion, and internal stress of diamond-like carbon (DLC) films grown by aspirating hydrocarbon gases (CH₄ and C₂H₂) and C₆H₆ vapors into a saddle field source. The source operates at 0.7-1.0 kV in the pressure range of 1.0X10⁻⁴-7.0X10⁻⁴ Torr and is of a modular design to cover increasingly larger areas. DLC films have been grown for the first time using CH₄ by this technique. The effect of source to substrate distance on the deposition rate and uniformity of the films has been studied at varying bower to the source using C₂H₂ gas. The films are found to be hard and they adhere well to 7059 glass, quartz, silicon, Mo, and Mylar substrates. Though the deposition rate increases with increasing power and with increasing carbon to hydrogen ratio of the hydrocarbon feedstock, the material properties are relatively independent of the type of hydrocarbon used. (C) 1995 American Vacuum Society.

L11 ANSWER 16 OF 16 SCISEARCH COPYRIGHT 2000 ISI (R)

AN 94:338897 SCISEARCH

GA The Genuine Article (R) Number: NN160

TI ELECTRONIC DENSITY-OF-STATES AND DEEP DEFECTS OF HYDROGENATED AMORPHOUS-CARBON (A-C-H)

AU SCHAFFER J (Reprint); RISTEIN J; LEY L

CS UNIV ERLANGEN NURNBERG, INST TECH PHYS, ERWIN ROMMEL STR 1, D-91058 ERLANGEN, GERMANY (Reprint)

CYA GERMANY

SO DIAMOND AND RELATED MATERIALS, (APR 1994) Vol. 3, No. 4-6, pp. 861-864.

ISSN: 0925-9635.

DT Article; Journal

FS ENGI

LA ENGLISH

REC Reference Count: 12

ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS

AB R.f. plasma chemical vapour deposition was used to prepare hydrogenated amorphous carbon (a-C:H) films with properties ranging from polymer-like to diamond-like carbon (DLC) depending on self bias ranging from 0 to 200 V. The films were characterized by their C 1s plasmon loss which yields the density and by **optical properties** such as the **refractive index** and the optical gap which decreases from 4.0 to 1.9 eV on bias. UV photoemission spectra were used to derive relative sp-contents which increase from 14% for polymer-like material to 37% for DLC. Two defect bands in the pseudogap with binding energies of 1.8 eV and 0.8 eV and an integrated electron density that increases with bias from 1 x 10²⁰ cm⁻³ to 7 x 10²⁰ cm⁻³ were identified with photoelectron yield spectroscopy. Transient changes in the deep defects of DLC on illumination with 680 nm wavelength light were observed and are discussed.

=> d his

(FILE 'HOME' ENTERED AT 14:27:22 ON 22 JUN 2000)

FILE 'BIOSIS, CAPLUS, MEDLINE, SCISEARCH' ENTERED AT 14:27:47 ON 22 JUN 2000

L1 21 S DLC AND (SENSOR OR BIOSENSOR)
L2 0 S L1 AND (WAVEGUIDE OR OPTIC? OR SPR OR PLASMON)
L3 15 DUP REM L1 (6 DUPLICATES REMOVED)
L4 17 S DLC AND (PLASMON)
L5 12 DUP REM L4 (5 DUPLICATES REMOVED)
L6 10 S DLC AND WAVEGUIDE
L7 7 DUP REM L6 (3 DUPLICATES REMOVED)
L8 148 S DLC AND OPTICAL PROPERTIES
L9 36 S L8 AND REFRACTIVE INDEX

L10 29 DUP REM L9 (2 DUPLICATES REMOVED)
L11 16 S L10 AND F 997

• => s l8 and porous?

L12 0 L8 AND POROUS?

=> s l8 and poro?

L13 0 L8 AND PORO?

=> s l8 and membrane

L14 0 L8 AND MEMBRANE

=> s dlc and poro?

L15 32 DLC AND PORO?

=> d l7 and (membrane or opti? or waveg?)

'AND' IS NOT A VALID FORMAT FOR FILE 'CAPLUS'

'(MEMBRANE;OR;OPTI?;OR;WAVEG?)' IS NOT A VALID FORMAT FOR FILE 'CAPLUS'

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CBIB ----- AN, plus Compressed Bibliographic Data
DALL ----- ALL, delimited (end of each field identified)
DMAX ----- MAX, delimited for post-processing
FAM ----- AN, PI and PRAI in table, plus Patent Family data
FBIB ----- AN, BIB, plus Patent FAM
IND ----- Indexing data
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PATS ----- PI, SO
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SCAN ----- CC, SX, TI, ST, IT (random display, no answer numbers;
SCAN must be entered on the same line as the DISPLAY,
e.g., D SCAN or DISPLAY SCAN)
STD ----- BIB, IPC, and NCL

IABS ----- ABS, indented with text labels
IALL ----- ALL, indented with text labels
IBIB ----- BIB, indented with text labels
IMAX ----- MAX, indented with text labels
ISTD ----- STD, indented with text labels

OBIB ----- AN, plus Bibliographic Data (original)
OIBIB ----- OBIB, indented with text labels

SBIB ----- BIB, no citations
SIBIB ----- IBIB, no citations

HIT ----- Fields containing hit terms
HITIND ----- IC, ICA, ICI, NCL, CC and index field (ST and IT)
containing hit terms
HITRN ----- HIT RN and its text modification
HITSTR ----- HIT RN, its text modification, its CA index name, and
its structure diagram
FHITSTR ----- First HIT RN, its text modification, its CA index name, and
its structure diagram
KWIC ----- Hit term plus 20 words on either side
OCC ----- Number of occurrence of hit term and field in which it occurs

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L7 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2000 ACS
AN 1998:614558 CAPLUS
DN 129:237967
TI Apparatus for deposition of diamond-like carbon
IN Sakamoto, Yuichi; Tada, Shigekazu; Saito, Hiroki
PA Nichimen Electronics koken K. K., Japan
SO Jpn. Kokai Tokkyo Koho, 5 pp.
CODEN: JKXXAF
DT Patent
LA Japanese
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 10251855	A2	19980922	JP 1997-61263	19970314
	JP 3009371	B2	20000214		

=> s l7 and (membrane or opti? or waveg?)

L16 7 L7 AND (MEMBRANE OR OPTI? OR WAVEG?)

=> s l15 and (membrane or opti? or waveg?)

L17 2 L15 AND (MEMBRANE OR OPTI? OR WAVEG?)

=> d bib ab 1-2

L17 ANSWER 1 OF 2 CAPLUS COPYRIGHT 2000 ACS
AN 1997:73052 CAPLUS
DN 126:121365
TI The electrochemical and wear behavior of amorphous diamond-like carbon coatings and multilayered coatings in aqueous environments
AU Drees, D.; Celis, J. P.; Dekempeneer, E.; Meneve, J.
CS Dep. MTM KULEuven, Louvain, B-3001, Belg.
SO Surf. Coat. Technol. (1996), 86-87(1-3), 575-580
CODEN: SCTEEJ; ISSN: 0257-8972
PB Elsevier
DT Journal
LA English
AB R.f. plasma CVD deposited diamond-like carbon coatings 1(DLC) possess interesting wear properties in dry testing conditions or in vacuum applications. Extremely low friction coeffs. are displayed in dry test conditions, the friction coeff. being dependent on relative humidity and presence of oxygen. The question arises whether these coatings are equally effective in an aq. medium. Parameters controlling the through-coating **porosity** are discussed and their relative importance indicated. A coulometric quant. **porosity** measurement has been used. Characterization by light **optical** microscopy, profilometric measurements and EMPA suggest the importance of the microstructure of the substrate material. Further, pin-on-disk wear tests in water show a detrimental damage when compared to dry wear tests. De-adhesion of the coating occurs in an early stage with subsequently a rapid destruction of the coating. Important parameters in this failure

mechanism are the initial contact stress and the development of this stress by initial wear

L17 ANSWER 2 OF 2 SCISEARCH COPYRIGHT 2000 ISI (R)
AN 97:64469 SCISEARCH
GA The Genuine Article (R) Number: WC006
TI The electrochemical and wear behaviour of amorphous diamond-like carbon coatings and multilayered coatings in aqueous environments
AU Drees D (Reprint); Celis J P; Dekempeneer E; Meneve J
CS KATHOLIEKE UNIV LEUVEN, DEPT MTM, DE CROYLAAN 2, B-3001 LOUVAIN, BELGIUM (Reprint); VLAASME INSTELLING TECHNOL ONDERZOEK, B-2400 MOL, BELGIUM
CYA BELGIUM
SO SURFACE & COATINGS TECHNOLOGY, (15 DEC 1996) Vol. 86-7, No. 1-3, Part 2, pp. 575-580.
Publisher: ELSEVIER SCIENCE SA LAUSANNE, PO BOX 564, 1001 LAUSANNE 1, SWITZERLAND.
ISSN: 0257-8972.
DT Article; Journal
FS ENGI
LA English
REC Reference Count: 9
ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS
AB R.f. plasma CVD deposited diamond-like carbon coatings (DLC) possess interesting wear properties in dry testing conditions or in vacuum applications. Extremely low friction coefficients are displayed in dry test conditions, the friction coefficient being dependent on relative humidity and presence of oxygen. The question arises whether these coatings are equally effective in an aqueous medium. Parameters controlling the through-coating **porosity** are discussed and their relative importance indicated. A coulometric quantitative **porosity** measurement has been used. Characterisation by light **optical** microscopy, profilometric measurements and EPMA suggest the importance of the microstructure of the substrate material. Further, pin-on-disk wear tests in water show a detrimental damage when compared to dry wear tests. De-adhesion of the coating occurs in an early stage with subsequently a rapid destruction of the coating. Important parameters in this failure mechanism are the initial contact stress and the development of this stress by initial wear.

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COST IN U.S. DOLLARS	SINCE FILE	TOTAL
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FULL ESTIMATED COST	177.44	177.59
DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)	SINCE FILE	TOTAL
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CA SUBSCRIBER PRICE	-25.60	-25.60

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